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Sept. 19th.

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SIR W. CROOKE'S ADDRESS AT THE BRITISH ASSOCIATION.

His Prophecy of "Universal Dearth" in the Wheat Supply-Wheat-Producing Soil of the World Unequal to the Strale That Will Be Put Upon It - Chemistry Must Come to the Bescue and Avert Starvation - Other Important Addresses - De Rougemont's Tales from Australia.

LONDON, Sapt. 10.-Bir William Crooke's presidential address to the British Associa-tion at Bristol dealt chiefly with the question of the food supply, not merely of the United Kingdom, but of the whole world. In a word, he prophesied that "universal dearth" was to be expected. He has been charged with undue pessimism, but he asserts that his statements are founded on stubborn facts, which senstrain him to show that the wheat-producing soil of the world is totally unequal to the strain put upon it. At the very outset, though, he relieved the minds of his hearers by promising that the chemist must come to the ressue of the threatened communities, and that through the laboratory starvation may ultimately be turned into plenty.

But before the fairy godmother, chemistry, was introduced, Sir William piled figures upon are doomed to a fate something very like star-

First of all, he dealt with the food supply of his own kingdom. He pointed out that the consumption of wheat per head of the population is over six bushels per annum; 240,000,-000 bushels of wheat are therefore required every year, with an annual increase of 2,000,-000 bushels to supply the increase of population. Of the wheat consumed in the United Kingdom 25 per cent. is grown a home and 75 per cent. is imported. At the best the stock wheat and flour amounts to 64,000,000 bushels, fourteen weeks' supply. Last April the stock only amounted to 10,000,000 bushels, the smallest ever recorded. Similarly stocks held in Europe, the United States and Canada, called "the world's visible sup-ply," amounted to only \$4,000,000 bushels, or 10,000,000 less than last year's sum total, and nearly \$2,000,000 less than that of 1893 or 1894 at the corresponding period.

He then referred to the suggestions which have been made of storing 64,000,000 bushels of wheat in national granaries, which would add fourteen weeks' life to the population in case of national disaster. But on this point he, would not venture to speak authoritatively. He described as more hopeful, though difficult and costly, the alternative of growing most, if not all, the necessary supply in the British Isles. The average yield over the United Kingdom last year was 29.07 bushels per acre, the average for the last ten years being 29.46. Therefore nearly 13,000 square miles, an area about one-fourth the size of England, increasing at the rate of 100 square the United Kingdom self-supporting as to bread food. Land of climate and quality suffleient for this he did not think an impossible demand, but he doubted if this amount of land could be kept under wheat, and the nec-essary expense of high farming faced except under the imperious pressure of impending starvation, or the stimulus of a national subsidy or permanent high prices. In any case, he concluded that the annual deficit of 150. 000,000 bushels must for the present be imported, and he added:

"A permanently higher price for wheat is, I lear, a calamity that ere long must be faced. At enhanced prices land now under wheat will be better farmed, and therefore will yield better, thus giving increased production without increased area."

He concluded his exclusive consideration of

the United Kingdom by saying:

"The burning question of to-day is, What can the United Kingdom do to be reasonably safe from starvation in presence of two successive failures of the world's wheat harvest, or against a hostile combination of European nations? We easerly spend millions to protect our coasts and commerce, and millions more on ships, explosives, guns, and men, but we omit to take necessary precautions to supply ourselves with the very first and supremely

Having thus impressed upon his hearers the rital importance his subject had for them, he took them by the hand, as it were, all over the wheat-growing and wheat-consuming portions of the globe. First of all, he considered the world's supply and demand.

Wheat is the most sustaining food grain of peoples of Europe, United States, British America, the white inhabitants of South Africa, Australasia, parts of South America, and the white population of the European colonies. Of late years the individual consumption of wheat has almost universally in-In Scandinavia it has risen 100 per cent. in twenty-five years; in Austria-Hungary, 80 per cent.; in France, 20 per cent., while in Belgium it has increased 50 per cent. "Only in Russia and Italy, and possibly Turkey, has the consumption of wheat per head declined.
"In 1871 the bread eaters of the world num-

bered 371,000,000. In 1881 the numbers rose o 416,000,000; in 1891, to 472,600,000, and at the present time they number 516,500,000. The augmentation of the world's bread-eating population in a geometrical ratio is evidenced by the fact that the yearly aggregates grow progressively larger. In the early seventies they rose 4,300,000 per annum, while in the eighties they increased by more than 6,000,-000 per annum, necessitating annual additions to the bread supply nearly one-half greater than sufficed twenty-five years ago. To supply 516,500,000 bread eaters, if each breadeating unit is to have his usual ration, will require a total of 2,324,000,000 bushels for seed and food. According to the best authorities the total supplies from the 1897-98 harvest are 1.921,000,000 bushels. The requirement of the 516,500,000 bread eaters for seed and food are 2,324,000,000 bushels; there is thus a deficit of 403,000,000 bushels, which has not been urgently apparent owing to a surplus of 200,000,000 bushels carried over from the

"Respecting the prospects of the harvest year just beginning it must be borne in mind that there are no remainders to bring over from last harvest. We start with a deficit of 103,000,000 bushels and have 6,500,000 more mouths to feed. The majority of the wheat erops between 1882 and 1896 were in excess of current needs, and thus considerable reserves of wheat were available for supplement-ing small deficits from the four deficient harvests. But bread eaters have almost eaten up the reserves of wheat, and the 1897 harvest being under average, the conditions become serious. That scarcity and high prices have not prevalled in recent years is due to the fact that since 1889 we have had seven world crops of wheat and six of rye abundantly in excess of the average. These generous crops inereased accumulations to such an extent as to obscure the fact that the harvests of 1895 and 1896 were each much below current require-

From this Sir William concluded that, reserves being practically exhausted, bread enters must be fed from current harvests. Even a harvest equal to the record one of 1894 would yield less than current needs.

Having drawn this gloomy picture of the

present, Sir William considered the future prospects. First of all, he examined the two chief wheat-exporting countries of the world, the United States and Russia. The former he described as having been for thirty years the dominant factor in the foreign supply of wheat, exporting no less than 145,000,000 bushels. Thus the bread-eating world has depended, and still depends, on the United States for the means of subsistence. But fir William way is us that the bread-eating world cannot for long rely upon this supply.

"Ale entire world's contribution to the

WORLD'S SUPPLY OF WHEAT | food-bearing area have averaged but 4,000,possible that such an average, under existing conditions, can be doubled for the coming twenty-five years. Practically there remains no uncultivated prairie land in the United States suitable for wheat growing. The virgin land has been rapidly absorbed, until at present there is no land left for wheat without reducing the area for mairs, hay and other necessary crops. It is almost certain that within a generation the ever-increasing poputhe United States will consume all the wheat grown within its borders, and will be driven to import, and, like ourselves, will scramble for a lion's share of the wheat crop of the world. The withdrawal of 145,000,000 bushels will cause a serious gap in the food

of the world. The withdrawal of 145,000,000 bushels will cause a serious gap in the food supply of wheat-importing countries, and unless this deflict can be met by increased supplies from other countries there will be a dearth for the rest of the world after the British Isles are awfliciently supplied."

Even less comfort is to be found in an examination of the Russian supply. Russia, with an annual emport of 25,000,000 bushels, is second to the United States as a wheat provider, and, to quote Sir. William's words: "Although Russia at present exports so lavishly, this excess is merely provisional and precarious. The Russian peasant population increases more rapidly than any other in Europe. The rield per acre over European Russia is meagre—not more than 8.6 bushels to the acre—while some authorities consider it as low as 4.6 bushels. The sost of production is low—lower even than on the virgin soils of the United States. The development of the fertile, though somewhat overrated, black earth, which extends across the southern portion of the empire and beyond the United States. The development of the fertile, though somewhat overrated, black earth, which extends across the southern portion of the empire and beyond the United States, and beyond the United States, the consumption of bread in Russia has been reduced to the danger point. The peasants starve and fall victims to hunger typhus, while the wheat grower, climate is the first consideration. Summers are short—as they are in all regions with continental climates north of the forty-fifth parallel—and the ripening of wheat requires a temperature averaging at least 65° Fahr. for fifty-five to sixty-five days. As all Sliperia lies north of the summer isotherm of 65°, it follows that such region is ill adapted to wheat outtire, unless some compensating climatic condition exists. The cultivable lands of western Siberia adapted to grain-bearing neither equal in extent por in potential productive powers to early five days. As all Sliperia lies north of the Siberia nev

with previnces:

With the previnces of the wheat-growing land yielding 18.261,850 bushels, one-fifth of which comes to hungry England. Thus far performance has lagged behind promise, the wheat bearing area of all Canada. having increased less than 500,000 acres since 1884, while the exports have not increased in greater proportion. As the wheat area of Manitoba and the Northwest has increased the wheat area of Outario and the greater being little and the greater being little and the growing requirements of population. We they seem calculations showing that Canada contains 500,000,000 acres of profitable wheat land. The impossibility of such an estimate ever being fulfilled will be apparent when it is remembered that the whole area employed in both temperate zones for growing all the stapls food crops is not more than 800,000,000 acres, and that in no country has more than 90 and that in no country has more than 60 and seems to the most promising district, as, according to the resultance of the sea been devoted to wheat culture. Turning to other sources of supply, Australia was next considered. Climatic conditions limit the Australian wheat area to a small portion of the southern littoral belt. Queensland seems to be the most promising district, as, according to Prof. Shelton, there are still 50,000,000 acres there suitable for wheat, but interest in the supply of the southern littoral belt. Queensland seems to be the most promising district, as, according to Prof. Shelton, there are still 50,000,000 acres there suitable for wheat, but interest in the supply of the profit of the supply of the supply

"Should all the whole the utmost capacity, on add to their area to the utmost capacity, on the most careful calculation the yield would give us only an addition of some 100,000,000 give us only an addition of some 100,000,000 which was a some world yield of

conditions to enable it to advance at a suffi-ciently rapid rate to become of commercial importance." Inportance."

Nitrosen, then, is evidently the fairy godmother which has to work the miracle. But
how? We are not to be made happy just yet.
Sir William ran over the several available
sources of nitrogen, and little comfort was to
be found therein. First of all there was the
sulphate of ammonia forused by the distillation of coal in the process of gasmaking. But
all Europe only produces 400,000 annual tons,
so this is dismissed as of not much significance.

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Gunno deposits go by the board in the same way as being so near exhaustion. Next is the discovery of Heliriegel and Wilfarth that leguminous plants bear on their roots nodestites abounding in bacteria endowed with the property of fixing atmospheric nitrogen. The suggestion therefore arises of cropping the soil with clover and ploughing in the plant, when its nitrogen assimilation is complete. But that has already been done as fa is safe, for the land soon becomes what is called "clover sick," and turns barren. Another invaluable source of fixed nitrogen to which Sir William referred was the sewage and drainage of the towns. He said:

"Individually the loss by the number of inhabitants and we have the startling fact that in the United Kingdom we are content to there so fixed nitrogen to the value of no less than £16,000,000 per annum. This unspeakable waste continues, and no effective and universal method is yet contrived of converting sewage into corn. The store of nitrogen in the atmosphere is practically unlimited, but it is fixed and rendered assimilable by plants only by cosmic processes of extreme alowness. The nitrogen which with a light heart we liberate in a battleship broadside has taken milions of minute organisms patiently working for centuries to win from the atmosphere."

Nitrate of soda, or Chili saltpetre, Sir Wil-

slowness. The nitrogen which with a light heart we liberate in a battleship broadside has taken millions of minute organisms patiently working for centuries to win from the atmosphere.

Nitrate of soda, or Chilli saltpetre, Sir William declared to be the only available compound containing sufficient fixed nitrogen to be used on a world-wide scale as a nitrogenous manure. The growing exports of nitrate from Chill at present amount to about 1,200,000 toms. The present world's wheat area is about 163,000,-000 acres.

"At the average of 12.7 bushels per acre this gives 2,070,000,000 bushels. But thirty years hence the demand will be 3,200,000,000 bushels, and there will be difficulty in finding the necessary acreases on which to grow the additional amount required. By increasing the present yield per acre from 12.7 to 20 bushels, we should with our present acreage secure a crop of the requisite amount. Now, from 12.7 to 20 bushels, per acre is a moderate increase of productiveness, and there is no doubt that a dressing with nitrate of soda will give this increase and more. The action of nitrate of soda in interoving the yield of wheat has been studied practically by Sir John Lawes and Sir Henry Gilbert on their experimental field at Rotharmatead. This field was sown with wheat for thirteen consecutive years without minure, and yielded an average of 11.9 bushels to the acre. For the next thirteen years it was sown with wheat and dressed with 5 cwt. of nitrate of soda per acre, other mineral constituents also being present. The average yield for these years was 36.4 bushels per acre—an increase of 24.5 bushels. In other words, 22.86 pounds of nitrate of soda produced an increase of one bushel of wheat.

At this rate 12.000,000 tons of nitrate would have to be distributed annually in varying amounts over the wheat-growing countries of the world. With regard to the amount of nitrate surviving in the nitre beds local authorities state that the raw material, containing from 25 to 50 per cent nitrate, will be exhausted in

of atmospheric nitrogen, and some of the processes have met with sufficient partial success to warrant experimentalists in pushing their trials still further; but I think I am right in saying that no process has yet been brought to the notice of scientific or commercial men which can be considered successful either as regards cost or yield of product."

This successful fixation of atmospheric nitrogen then is to solve the vexed question. And, according to Sir William Crookes:

"The fixation of nitrogen is a question of the not far distant future. Let me see if it is not possible even now to solve the momentous problem. As far back as 1822 I exhibited, at one of the soirées of the Royal Society, an experiment on "The Flame of Burning Nitrogen." I showed that nitrogen is a combustible gas, and the reason why when once ignited the flame does not spread through the atmosphere and deluge the world in a sea of naitric acid is that its igniting point is higher than the temperature of its flame—not, therefore, hot enough to set fire to the adjacent mixture. But by passing a strong induction current between terminals the air takes fire and continues to burn with a powerful flame, producing nitrous and nitric acids. This inconsiderable experiment may not unlikely lead to the development of a mighty industry, destined to solve the great food problem. With rent between terminals the air takes fire and continues to burn with a powerful flame, producing nitrous and nitric acids. This inconsiderable experiment may not unlikely lead to the development of a mighty industry, destined to solve the great food problem. With the object of burning out ultrogen from air so as to leave argon behind, Lord Rayleigh fitted up apparatus for performing the operation on a larger scale, and succeeded in effecting the union of 20.4 grammes of mixed nitrogen and oxygen at an expenditure of one horse-power. Following, these figures, it would require one Board of Trade unit to form 74 grammes of nitrate of soda, and therefore 14,000 units to form one ton. To generate electricity in the ordinary way with steam engines and dynamos, it is now possible, with a steady load night and day, and engines working at maximum efficiency, to produce current at a cost of one-third of a penny per Board of Trade unit. At this rate one ton of nitrate of soda would cost £26. But electricity from coal and steam engines is too costly for large industrial purposes; at Niagara, where water power is used, electricity can be sold at a profit for one-seventeenth of a penny per Board of Trade unit. At this rate intract of soda would cost not more than £5 per ton. But nitrate of soda unit. At this rate nitrate of soda would cost not more than £5 per ton. But nitrate of soda unit. At this rate nitrate of soda would cost not more than £5 per ton. But nitrate of soda would cost not more than £5 per ton. But nitrate of soda with these apparently hopeless difficulties. Nitrate can be produced artificially by the combustion of the atmosphere. Here we come to finality in one direction; our stores are inexhaustible. But how about electricity? Can we generate enough energy to produce 12,000,000 tons of nitrate of soda annually?

"A preliminary calculation shows that there need be no fear on that score. Niagara alone is capable of supplying the required electricity of the search of the search of the supply wet may safely le

and to their area to the unmost capacity, on the most careful calculation to yield would give us only an addition of some 10/10/09/09/09 acres, supplying, at the average world yield of control of the c or three successive crops of foodstuffs in extraordinary abundance. To mention one plant alone, Humboldt-from what precise statistics I know not-e imputed that, acre for acre, the food productiveness of the banana is 133 times that of wheat-the unripe banana, before its starch is converted into sugar, is said to make excellent broad. Considerations like these must in the end determine the range and avenues of commerce, perhaps the fate of continents. We must develop and guide nature's latent energies, we must utilize her immost workshops, we must call into commercial existence Central Africa and Brazil to redress the balance of Odessa and Chicago."

I have glimpses of something like coherence among the strange clusive phenomena; of something like continuity between those unexplained forces and laws already known. This advance is largely due to the labors of another association of which I have also this year the hone; to be President—the Scelety for Psychical Bessarch. And were I now introduce with the continuity of the continuity of

variations from the normal waking condition are necessarily morbid. The human race has reached no fixed or changeless ideal; in every direction there is evolution as well as disintegration. It would be hard to find instances of more rapid progress, moral and physical, than in certain important cases of cure by suggestion—again to cite a few names out of many—by Liebeault, Bernheim, the late Auguste Voisin, Berillon (in France). Schrenck-Notzing (in Germany). Forel (in Switzerland). Van Eeden (in Holland). Wetterstrand (in Sweden). Milne-Bramwell and Lloyd Tuckey (in England). This is not the place for details, but the vis medicatriz thus evoked, as it were, from the depths of the organism is of good omen for the upward evolution of markind. A formidable range of phenomena must be scientifically sifted before we effectually grasp a faculty so strange, so bewildering and for ages so inscrutable as the direct action of mind on mind.

"This delicate task needs a rigorous employment of the method of exclusion—a constant setting aside of irrelevant phenomena that could be explained by known causes, including those far too familiar causes, conscious and unconscious fraui. The inquiry unites the difficulties inherent in all experimentation connected with mind, with tangled human temperaments, and with observations dependent less on automatic record than on personal testimony. But difficulties are things to be overcome, even in the elusory branch of research known as experimental psychology. It has been characteristic of the leaders among the group of inquirers constituting the Society for Psychical Research to combine critical and negative work with work leading to positive discovery. To the penetration and scrupulous fairmindedness of Prof. Henry Sidgwick and of the late Edmund Gurney is largely due the establishment of canons of, evidence in psychical research, which strengthen while they narrow the path of subsequent explorers. To the detective genium of Dr. Richard Hodgson we

search; which strengthen while they narro the path of subsequent explorers. To it detective genius of Dr. Richard Hodgson w owe a convincing demonstration of the narro limits of human continuous observation. has been said that 'nothing worth the provin can be proved, nor yet disproved. True though this may have been in the past, it is true no longer. The seience of our century has forged weapons of observation and analysis by which the veriest tyro may profit. Science has trained and fashioned the average mind into habits of exactitude and disciplined perception, and in so doing has fortified itself for tasks higher, wider, and incomparably more wonderful than even the wisest among our ancestors imagined. Like the souls in Plato's myth that follow the charlot of Zeus, it has ascended to a point of vision far above the earth. It is heffecforth open to science to transcend all we now think we know of matter and to gain new glimpses of a profounder scheme of cosmic law. An eminent predecessor in this chair declared that by an intellectual necessity he crossed the boundary of experimental evidence, and discerned in that matter which we, in our innovance of its latent powers, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the potency and promise of all terrestrial life. I should prefer to reverse the apophthegm, and to say that in life I see the promise and potency of all forms of matter. In old Egyptian days a well-known inscription was carved over the portal of the temple of Isis: I am whatever hath been, is, or ever will be, and my veli no man hath yet lifted. Not thus do modern seekers after truth confront nature—the word that stands for the baffling mysteries of the universe. Steadily, unflinehingly, we strive to plerce the inmost heart of nature, from what she is to reconstruct what she has been, and to prophesy what she yet shall be. Vell after veil we have lifted, and her face grows more beautiful, august, and wonderful with every barrier that is withdrawn." n be proved, nor yet disproved." Tru

At the second day's meeting Prof. Ayrton President of the Mathematical and Physical Science Section, delivered an address upon the sense of smell. In this he dealt chiefly with the generally accepted idea that metals have smells. He said:

"I find that, as commercial aluminum, brass, bronze, copper, German silver, gold, fron, silver, phosphor-bronze, steel, tin, and zinc are more and more carefully cleaned, they become more and more carefully cleaned, they become more and more alike in emitting no smell; and, indeed, when they are very clean, it seems impossible with the nose, even if it be a good one, to distinguish any one of these metals from the rest, or even to detect its presence."

These people are men, women and children the sense of smell. In this he dealt childry with the generally accepted idea that metals have smells. He said:

"I find that, as commercial aluminum, brass, brouze, copper, German silver, gold, from, silver, phosphor-bronze, steel, tin, and zinc are more and more carefully cleaned, they become and, indeed, when they are very clean, it seems impossible with the nose, even if it because a good one, to distinguish any one of these metals from the rest, or even to detect its presented."

He showed that metals acquire a smell bring of perspiration and not merely to heat, moisture or salts.

"Before a metal can evolve a smell chemical action must apparently take blace, for rubbing the metal torobably frees metallic particles and facilitates the chemical actions which I shall have been readily action of perspiration and not merely to heat, moisture or salts.

"Before a metal can evolve a smell chemical action must apparently take blace, for rubbing the metal torobably frees metallic particles and facilitates the chemical actions by the strength of the metals are produced as that I have enumerated with a lump of wet sugar, although the chemical action cortainly takes place. J gain, the strength of the strengt

and the iron and start give rise to the characteristic 'ron' amed, which in this case can be detected come feet away. Now, it is known that when hydrogen is evolved by the action of sulphuric acid on iron the gas has a very unpleasant smell, and this, Dr. Tilden tells me, is due to the presence of hydro-carbons, and especially of parafine. I have been, therefore, led to think that the smell of iron or steal when held in the hand is really due to the hydro-carbons to which this operation gives rise, and it is probable that no metallic carticles, even in the form of vapor, reach the nose or even leave the metal. Hence, although smell may not, like sound, be propagated by vibration, it seems probable that particles of the metal with which we have been accustomed to associate the particular smell may no more come into contact with the olfactory nerves than a sounding musical instrument strikes against the drum of the ear. And the same sort of result may occur when a metal is rubbed, for, although in that case particles may very likely be detached, it seems possible that the function of these metallic particles may be to act on the moisture of the air and liberate hydrogen similarly contaminated, and that in this case also it is the impurities which produce the smell and not the particles of the metal with which we have been accustomed to associate it. This view I put forward tentatively, and to further elucidate the matter I am about to begin a series of smell tests in various gases, artificially dried, with metals as pure as can be obtained."

Mr. Brabrook, President of the Anthropological section, at Friday's meeting delivered an address upon "The Unity of the Anthropological section, at Friday's meeting delivered an address upon "The Unity of the Anthropological section, at Friday's meeting delivered and comparative anthropology, psychology, inguistics, folk-lore, ethnography, ethnology as a group of sciences comprising physical and comparative anthropology, psychology, inguistics, folk-lore, ethnography, ethnol

versal validity, and cannot but add force and sublimity to our imagination of the wisdom of the Creator.

"In briefly drawing your attention to some recent contributions to our knowledge, we are called upon to consider the discovery by Dr. Dubois at Trinii in Java of the remains of an animal called by him Fithecanthropus erectus, and considered by some authorities to be one of the missing links in the chain of animal existence which terminates in man. The physiological difficulties arise in two points—do the skull and femur belong to the same individual? Are they or either of them human or simian, or intermediate? With regard to the skull, a projection of its outline on a diagram comparing it with others of low type belonging to the stone age shows it to be essentially inferior to any of them. With regard to the thigh, a comparison with Dr. Hepburn's remarkable collection of femora tends to show that the bone is human, and that it belongs to an exceedingly low and ancient type of humanity. We are thus in presence of a valuable document in the early evolution of mankind. One element of special interest in this discovery is that it brings us nearer than we have ever been brought before to the time when man or his predecessor acquired the erect position. I believe that it is acknowledged by all that the femur belonged to an individual who stood uvright, and I presume that the capacity of the skull being greater than that of any known anthropoid is consistent with the same inference. The significance of that has been most clearly set forth by my predecessor, Dr. Munro, in his address to this section at Nottingham findence of that has been most clearly set for hy my predecessor. Before man being controlled by a progressive brain, everything follows in due course. The next stage which we are yet able to mark with certainty is the paleolithic, but there must have been a stage of more or less length during which he used any stick or stone that came to his hands without attempting to fashion the one or the other. Anothe the south of France. If we are compelled to admit a breach of continuity in Europe, is it in Africa that we shall find the missing links? That is another of the great problems yet unsolved. The evidence we want relates to events which took place at so great a distance of time that we may well wait patiently for it, assured that somewhere or other these missing links in the ain of continuity must have existed and pre-bly are still to be found."

ing links in the ain of centinuity must have existed and pre. bly are still to be found."

M. Louis de Rougemont, "the Australian Crusoe," whose stories about his life among the blacks of Northwest Australia have excited wonder and also incredulity, was permitted on Friday to read a long paper on his twenty-eight years sojourn among those cannibals. About the year 1863 he joined a pearling expedition, and was wreeked on a small sandspit in the Sea of Timor. Here he spent two and a half years, and only reached the Australian coast through the instrumentality of a party of blacks who had been blown out of their course. Together they reached the mainland of Australia in the Cambridge Gulfreglon, on the northwest coast of the continent. Here he spent several years, making various excursions, but at length he struck southward into the interior of the continent, where he spent upward of twenty years with the aborigines. Commencing with a description of the maining and decorating of the southward into the interior of the continent, where he spent upward of twenty years with the aborigines. Commencing with a description of the painting and decorating of the body, the lecturer said that practically the only clothing known to these savages consisted of a coating of grease, clay and powdered charcoal, sometimes scented with a kind of pennyroyal herb, and on which fea hered tufts were often stuck. He then said that their habitations are not houses in the ordinary sense of the term, but rude huts, oval or round, and merely shelters or breakwinds made of bark or boughs, in front of which a fire was kept burning. On the denth of a person his house is burned so that the dead man's spirit may not be lingering around. These houses are not permanent, for when the occupiers have left they never return to the same dwellings, but generally leave them to decay. The native crawls into his house through a hole measuring about fifteen inches by ten inches.

These people are—men, women and children—expert divers and swimmers, as much at home in the water as on land. They chiefly adopt the side stroke, using both hands alternately. Swimming is not taught, but is supposed to be a natural action, the children's contractions of the children's contraction of the children's contracti

beems to be to acquire the valor and virtues of the person eaten. M. de Rougemont said be endeavored to weat the tribes in his mountain home from the practice by assuring them that if they made bracelets, anklets and nerklaces out of the dead man's hair they would a his worther end equality well. The natives believe in no detry, but in a surreme spirit, who is not worshipped, but proseitated. The soul is supposed to haunt the habitation after death and to pass into other bodies.

Priests of any kind do not exist, but the medicine man is a power in the land, for he has nower to decode even the hand, for he has nower to decode even the hand, for he has nower to decode even the hand, for he has nower to decode even the dead are never mentioned, but referred to in an hadirect way. A dead chief might thus be alitaked to under cover of the name of his greatest bariefield. Their supersitions are many and varied, and dreams they believe in implicitly. Mants and witcheraft are practiced extensively, both the black and white varieties.

As to crimes, homicide is criminal, except in case of a general battle or a private quarrel, where the dead man was in the wrong. There is never any dissent from the authority of the headmen. There is no criminal class nor any organized system of crime, nor annown precepts in the children by their parents and are upheld by the headmen and council. There is no bublic orbinion, for whatever the headmen decide as correct is obeyed invincitify. Children are never ill-treated or punished. Hospitality is extended toward all men. It is wicked to refuse it, and mean to stint it. It is wrong to deceive or steal, except in regard to enemies. Reverence to the aged is an absolute virtue. The land does not belong to the children have not inflict the substance of the children have a proper to the

way and never dies. Every moon is supposed to be a fresh one and different from the ast. Arithmetic is practically unknown, there being spoken words for numbers only up to four.

Marriage is not regarded as a religious ceremony. A young man avoids his mother-in-law like the plague. He believes that if he even speaks to her his hair will turn gray. In certain rare tribes communal or group marriage prevails. Each man is the husband of all the women and each woman is the wife of all the men. All the wives are of equal rank. Naturally quarrels occur among the women, usually on account of favoritism shown by the husband, or the introduction of a young and relatively beautiful woman. In the event of a quarrel the two women would retire from the camp armed with a stick or sticks, and they would simply exchange blow for blow on the head without any attempt at parrying—which would be fatal to the woman's life, so great is the contempt the natives have for physical cowardice. It was aimply a question of endurance, and when at length one woman is unable to rise from the earth the fight is at an end, and the two combatants dress one another's wounds in the most amicable manner.

The lecturer then discussed the children's games and amusements, tribal marks and then death and burial. Speaking generally, death from natural causes is unknown, except in the case of very young children. It is brought about by the witcheraft of an snamy, mostly through maric performed by a sorcerer; otherwise they believe they would live forever. The dead body is kept in camp and "waked" for one night, the women moaning and walling a most plaintive lamentation. Fresh leaves of the man's own 'totem' tree are placed in the grave and every detail of viewes and even months. M. de Rougemont, in concluding his address, and the State is landlord, and the people know not rent, rates or taxes. Every man has a wile—he himself was promptly previded with one—every woman a husband, each child has many fathers and mothers, as he is the child of he bribe. The i

mont.

Prof. Tylor put M. de Rougemont through a faort catechism, asking him the names for man and woman, sun and moon and fire and water and other common objects and the methods of hafting blades to the handles of stone hatchets among the black natives, and took down the answers for verification.

methods of hafting blades to the handles of stone hatchets among the black natives, and took down the answers for verification.

At the same meeting a paper "On the Extraction from Air of the Companions of Argon, and on Neon," by Prof. William Ramsay and Mr. Morris W. Travers was read.

It had been mooted by Dr. Johnston Stoney that the atmosphere of our planet might be expected to contain new gases, if such exist at all, with densities higher than 8 or thereabouts. The authors therefore set to work to ascertain whether it was possible to separate light and also heavy gases from argon. The method adopted was systematic repeated liquefied gases. As much as 18 litres of argon were submitted to experiment, and in course of treatment gas of lower and lower density was obtained, ranging from 17 to 9.76—in fact, until a stage where the gas was no longer liquefiable under the existing conditions—namely, that of the temperature of air boiling under a pressure of about 10 millimetres. This gas was neon mixed with minute quantities of argon and nitrogen; therefore, making allowance for these, the density of neon would be itd. Neon, moreover, fulfils the conditions forefold for such an element; it is monatomic, its refractivity is low, 0.3071, or probably lower, and it has a characteristic spectrum. Coincidentally it was noted that neon is not the only companion of argon met with in these experiments, for in addition to it there are krypton, metargon, with a spectrum closely resembling that of carbon monoxide, and a still heavier gas not previously described, which the authors propose to name xenon, which exists only in very minute quantity. As regards neon the 18 litres of argon did not contain more than 50 cubic centimetres of it; the proportion in air must therefore be about one part in 40,000.

Prof. J. Emerson Reynolds explained in another contribution that these new elements fell properly into the ranks of the periodic classification of elements, a fact much appreciated in chemical circles, while Sir Norman Lockyer

The Weather. The unsettled conditions which prevailed in the

central States on Saturday have disappeared, and yesterday only a few showers, due to cooler weather, fell in the Arkansas Valley and lower Mississipp States. In all other districts fair weather prevailed It was cooler in the Northwest and Southwest, bu warmer generally in the Ohio Valley, lake regions Middle Atlantic and New Eugland States. The pres sure was higher in the central districts, indicatin fair weather for a day or two. The only low preasur of importance was in the lower California region. In this city there was a dense fog in the early morn ing, which lifted about 7 o'clock, after which the day was fair; highest official temperature, 84°; lowest 66°; average humidity, 72 per cent.; wind generally south to west; average velocity, 15 tailes an hour; barometer, corrected to read to sea level, at 8 A.M., 29.96; 3 P. M., 29.83.

The temperature, as recorded by the official ther mometer and also by THE SUN'S thermometer at the street level, is shown in the annexed table:



For New England and eastern New York, thowers in early morning, followed by fair weather; fresh to brish For the District of Columbia, eastern Pennsylvania

New Jersey, Delaware, Maryland and Virginia, fair;

continued high temperature; light to fresh west

Broadway & 20th St. SHOT IN A DRUNKEN BAGE Chicago Man Wounds a Woman and & Child and Kills Himself. CHICAGO, Sept. 18.—Revenge for functed wrongs prompted Fred Benfield in a fit of drunken rage to shoot and fatally wound Mrs Emily Jungenberg and her baby son, Emil, last

head. The wounded woman and child were conveyed to the German Hospital in Laribee street, where the boy died. The woman is not expected to live. Mrs. Jungenberg was shot in expected to live. Mrs. Jungenberg was shot in the abdomen and right hip. The child's lung was pierced with a bullet.

There was no provocation for Benfield's orline. Mrs. Jungenberg was his tenant, renting a couple of rooms in his house. Benfield lived on the carnings of his wife and grewn daugh-ter. He had them completely terrorized by threats of murdering them and they rejoiced when they learned that he was dead.

evening at, 90 Ulland street. Then he com-mitted suicide by sending a bullet through his

MARINE INTELLIGENCE.

MINIATURE ALMANAC-THIS DAY. HIGH WATER-THIS DAY. Sandy Hook. 9 18 | Gov. Ial'd. 9 45 | Hell Gate. 11 80

Arrived-Sunday, Sept. 18. Ss La Normandie, Fajolle, Havre Sept. 10, Ss La Campine, Markschlager, Antwerp. Ss Victoria, Farrington, London. Ss Colin, Archer, Thorsen, Shieda. Ss Port Melbourné, Smith, London. Ss Angola, Carruthers, Rio Janeire, Su Orinoco, Fraser, Bermuda. Ss Jamestown, Boaz, Norfolk. Ss Fi Mar, Grant, New Orieans. St Tallahassee, Askine, Savannah. U.S. Transport Michigan, Tubb, Santiage. Ship Grace Harwar, Jinut, Plaagua. [For later arrivals see First Page.]

ABBITED OUT. Se La Champagna, from New York, at Havre. Se Barbarossa, from New York, at Southampt

Ss H. H. Meier, from Bremen for New York, passed Dover.

Sa Kaiser Wilhelm II., from Genos for New York,
passed Gibraltar.

Sa Friesland, from Antwerp for New York, passed
Prawle Point.

SATLED FROM POREIGN PORTS. SATURD FROM DOMESTIC BORDS

Es Seminole, from Jacksonville for New York. OUTGOING STRAMBUTES. Sail To-Day. Algonouin, Charleston

| Sail To-Morrow, | Benison, Hayti. | 100 P M | Servis, Liverpool | 6 06 A M | Coleridge, Pernambuoo | 9 06 A M | Tave, Bremes | 7 00 A M | Gran Antilla, Havana | 10 30 A M | El Mar, New Orleans | | | Sail Wednesday, Sept. \$1. Adirondack, Ringston. 10 00
Fontabelle, St. Kitts. 12 39
Orizaba, Havana 1 00
Cherokee, Charleston.
Belvernon, Hayti. 10 00
Prins Willem III., Curscos. 10 30
Arkadis, Porto Rico. 2 00

Due To-Day. Antwerp.
Savannah
Port Spain.
Havana.
Havre
Glasgow.
Liverpool.
St. Michaels

Bremen ... Southampt Antwerp, ... Port Limon Due Wednesday, Sept. 21. Kansas City Due Thursday, Sept. 22, Hamburg Galveston New Orlea Dus Friday, Sept. 23. Liverpool. Liverpool. Gibraltar... Gibraltar... Christianss St. Lucis...

Ausiness Mattres.

Due Saturday, Sept. 24.

Dr. Siegert's Angostura Bitters, the re-nowned appetizer, is used over the whole civilized world; is imported from South America.

DIED.

BIGLIN.—At his home, Far Rockaway, L. I., Sopt. 16, Joseph C. Biglin, in his 55th year. Funeral services will be held at the Church of Many Star of the Sea, Far Rocksway, Monday, Sept. 19, at 10:30 o'clock. Interment in Calvary Comtery on arrival of train due at Long Island Offi at 12:16. HALL.—On Sept. 17, C. Elterner Hall, nee Sheeby,

wife of Frank B. Hall.

Funeral services on Tuesday, Sept. 20, at 11 A. M.,
at the Church of Our Lady of Perpetual Help,
Highlands of Navesink of Jersey. Train leaves
New Jersey Central Bailroad at Liberty street at 8:30 A. M. Carriages will meet train. Jackson-ville and Saratoga papers please copy. WcDOWELL.—On Sept. 18, 7:40 P. M., at 28 Each

22d st., Albert McDowell, husband of Alice Sub cliffe McDowell, SEWARD.—At Montclair, Friday, Sept. 16, of heart failure and typhoid fever, Lieut. Charles W. Sew-ard, Ninth New York Volunteers, eldest son of

Emott and Ella J. Seward. Funeral Monday, Sept. 19, at the residence of his father, 107 Park at., of arrival of train on Grean-wood Lake Esilroad leaving Jemey City at 2:88

SHANASY .- On the 17th inst., Jeremiah J. Shan asy, aged 52 years.

Relatives and friends are respectfully invited to attend the funeral services at St. Luke's M. M. Church, 41st st., between Broadway and 6th av.,

on Monday evening at 8 o'clock. TIGHE.—In the Church of the Holy Spirit, Asbury Park, N. J., on Tuesday, Sept. 20, at 11:50 o'clock, there will be a solemn mass of requiem for Bose Tighe. It will then be a month since ber death. Belatives and friends are invited by this